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the chest of the gibbon — except that he can make a fire, and cook his food. There is the skeleton of a female in the Paris 'Jardin des plantes.'

SAMUEL KNEELAND.

THE AMERICAN EXHIBIT AT THE LONDON FISHERIES EXHIBITION.

The opening of the great international fisheries exhibition in London brings into view some of the numerous advances which have been made by our own commission in the investigation of the fisheries of the United States. In 1880, at Berlin, the extent of its researches and the importance of its achievements, indicated by the collections which were there displayed, were deeply impressed upon the representatives of other nations, and won for it the highest meed of honor. During the three years which have since elapsed, the activity of the commission has suffered no decline; and the display now made in London is undoubtedly superior in most respects to that made at the previous exhibition. It is impossible in this place to call attention to more than a few of the salient features of the American section of the exhibition.

The preliminary catalogue opens with a classified list of the aquatic animals and plants of North America, beneficial or injurious to man. Among the mammals, we note the group of fur-seals, procured some years ago through the efforts of the Alaska commercial company, and mounted with great care, and much fidelity to nature. The group is accompanied by a series of sketches by Mr. Henry W. Elliott, illustrating the fishery. A stuffed specimen of the rare ribbon-seal (*Histiophoca equestris*) from Alaska, and a skull of the Rhytina, are also included here. A remarkable pair of walrus-tusks, each 41 inches long and weighing about 12½ pounds, loaned by the Alaska commercial company, are exhibited in this connection. The cetacean fauna of North America is well represented by casts and skulls. The aquatic fish-eating birds, including those used by the fishermen for bait, are represented by groups of mounted specimens. The staining of the feet and bills in natural colors, a feature not hitherto introduced into the taxidermy of the national collections, gives a decidedly life-like air to these groups. Most interesting among the reptiles and batrachians, perhaps, are a large leather-back turtle (*Dermatochelys coriacea*) and a collection of twenty-four species of tailed batrachians (*Siren*, *Necturus*, *Siredon*, etc.). The exhibit of fishes is, as may be expected, very comprehensive. The alco-

holic collection, selected with great care by Dr. Bean, includes over four hundred species. More than one hundred especially characteristic American fishes are represented by painted casts of a very high grade of workmanship. A series of photographs from fresh specimens, and another of engravings, both made under the direct supervision of the ichthyologists of the commission, are of especial interest to the zoölogist. During the exhibition, shipments of fresh fish will be sent to London daily by Mr. E. G. Blackford of New York. In the collection of mollusks the American oyster occupies a prominent place. By means of engravings, diagrams, and shells, the result of the latest researches upon its development, growth, and geographical distribution, are fully shown. The models of a giant squid (*Architeuthis princeps*) and of a giant octopus (*Octopus punctatus*) prepared under the direction of Mr. J. H. Emerton, have already been described in an earlier number of SCIENCE. A large series of other invertebrates — crustaceans, worms, echinoderms, and sponges — has been prepared by Mr. Richard Rathbun. Among the most interesting are a complete collection of the species of fresh-water crayfishes found in the United States, and a series of sponges illustrating artificial propagation by cuttings. The Algae of the United States are represented by a collection of marine forms by Professor Farlow, and a series of proofs of the plates of Wood's Fresh-water Algae.

The second section of the catalogue treats of the fishing-grounds, and the distribution of aquatic animals. The models and maps here included are the fruit of a vast amount of toil, and are of high scientific value. Each is worthy of detailed examination. The relief-models of the Atlantic coast and of the offshore fishing-banks have been alluded to in a previous number of SCIENCE. Among the most interesting maps may be mentioned those showing the location and extent of the present and of abandoned whaling-grounds, by Mr. A. Howard Clark; the distribution of the pinnipeds, by Mr. J. A. Allen; the distribution of the seals and other fur-bearing animals of Alaska, by Capt. William H. Dall; the distribution of certain American fishes, by Mr. G. Brown Goode; and the location and extent of the oyster-beds of the United States, by Lieut. F. Winslow.

The third and fourth sections, which are devoted to fishery apparatus, would be almost solely interesting from a technological point of view, were it not for the numerous speci-

mens of Indian and Eskimo fishery implements which they include. The latter collection, which attracted much attention among the German anthropologists in 1880, has received many important additions through the explorations of Messrs. Dall, Bean, and Nelson, in Alaska.

Section E, which relates to the fishermen themselves, contains at least one collection interesting to the ethnologist. It illustrates the *cultus* of the American fisherman. Here are shown the games he plays, the books he reads, the products of the arts he affects, and the musical instruments upon which he performs. In another place is shown a series of large photographs from life, of fishermen of different nationalities employed in the fisheries of the United States.

The collection of biological works in the section devoted to literature forms an epitome of the development of the study of aquatic life in America. The writings of the earlier biologists — the elder Agassiz, Holbrook, Storer, Girard, Stimpson, and many others — are displayed; and in the list of special contributors are the names of Agassiz, Goode, Faxon, Dall, Jordan, Farlow, Ryder, Bean, Verrill, Lockington, and of many other prominent American biologists of the present day. It is much to be hoped that these volumes of papers, which have been gotten together with much labor both by the authors and the commission, may find their way, at the close of the exhibit, to the library of the commission or of the national museum.

Apparatus for scientific investigation of the waters is displayed not only by the fish commission, but by the coast-survey and signal-bureau as well. The latest improvements in sounding and dredging apparatus are represented, and the newest devices in barometers, thermometers, and other similar instruments. Among these are Professor Hilgard's recently invented densimeter and salinometer, Lieut. Tanner's deep-sea sounding-machine, Mr. Benedict's rake-dredge for annelids, and numerous others, many of which form part of the equipment of the fish-commission steamer *Albatross*.

In the manifold forms of apparatus for hatching fishes, the far-seeing zoölogist will see something more than machines for increasing the supply of food-fishes. Important though they be in that connection, they will appear in a new light as delicate instruments for embryological and physiological research, when a greater number of our ichthyologists shall have turned their attention from the taxonomy to the natural history of fishes.

We have not space to dwell upon the collections representing the various products of the fisheries; but there is much in the elaborate display of fish and fertilizers, of glues and oils, of leathers and furs and sponges, and the innumerable commodities which form the harvest of the seas, to attract the attention, and busy the thought, of the political economist and business-man.

It is too soon to say what rank the American division may attain in the exhibition; but one may be safe in remarking that there is no country in the world in which any of the great explorative industries have been subjected to a more thorough investigation from both a scientific and economic point of view than the fisheries of the United States are now undergoing at the hands of the national fishery commission.

NOTE RELATING TO A PECULIARITY DISTINGUISHING ANNEALED FROM UNANNEALED IRON.

THE writer has had occasion recently to study the effect of prolonged stress upon the various materials in common use in the arts, and, among others, upon the finer qualities of iron. The well-known experiment of Vicat, made a half-century ago, had never, so far as the writer was aware, been repeated. The extreme importance of the results obtained by him had apparently not been realized by either physicists or engineers; and it seemed advisable that the experiment be repeated, and, should the results obtained by Vicat be again reached, that the attention of both scientific and practical men should be again called to the subject. The repetition of Vicat's experiment has not only confirmed his conclusion, but has led to the discovery of a new and important, as well as peculiarly interesting, difference in the effect of prolonged stress upon annealed and unannealed iron.

In the autumn of the year 1881, the writer procured two lots of the best Swedish iron wire from Mr. William Hewitt, the vice-president of the Trenton iron and steel works, who very kindly had the wire drawn for the purpose. This wire was divided into two parts, one being carefully annealed, the other being left hard-drawn as it came from the blocks. These were tested in the usual way, and it was found that the hard wire had about double the strength of the soft. Nine pieces were taken from each reel for test, under prolonged static stress, and were suspended from hooks, in the study of the writer, attached to springs,